

**TOEROEK
ASSOCIATES, INC.**

July 26, 2018

CON12-15
Doc #36322



Mr. Brian Mitchell
Task Order Contracting Officer Representative
U.S. Environmental Protection Agency, Region 7 (EPA Region 7)
11201 Renner Boulevard
Lenexa, KS 66219

**Subject: Monitoring Well Installation and Groundwater Sampling Event
Final Report of Findings
Former Electrolux, Inc. Facility, Jefferson, Iowa
Contract No. EP-W-13-002, Task Order 035, Technical Directive No. 8**

Dear Mr. Mitchell:

The Toeroek Associates, Inc. team is pleased to submit the Final Monitoring Well Installation and Groundwater Sampling Event Report of Findings at the former Electrolux, Inc. facility in Jefferson, Iowa. Revisions were made in accordance with comments received July 24, 2018.

Please call me at (816) 412-1760 if you have any questions regarding this submittal.

Sincerely,

Lauren Holt
Task Order 35, Technical Directive No. 8 Manager

Attachment

cc: Kristy Throckmorton, Regional Task Order Contracting Officer
Representative (cover letter only)
Paul Kieler, Toeroek Team Program Manager (cover letter only)
Kathy Homer, Toeroek Team Regional Manager (cover letter only)
File

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**FORMER ELECTROLUX, INC. FACILITY JEFFERSON, IOWA
MONITORING WELL INSTALLATION AND GROUNDWATER SAMPLING EVENT
FINAL REPORT OF FINDINGS**

PREPARED FOR

**U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 7**

Task Order No.	:	035
Technical Directive No.	:	8
EPA Region	:	7
Date Prepared	:	July 26, 2018
Contract No.	:	EP-W-13-002
Prepared by	:	Toeroek Team
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CONTENTS

<u>Section</u>	<u>Page</u>
EXECUTIVE SUMMARY	iii
1.0 INTRODUCTION	I
1.1 PURPOSE OF REPORT	I
1.2 REPORT ORGANIZATION	1
2.0 SITE BACKGROUND	2
2.1 SITE LOCATION	2
2.2 HISTORICAL SITE USE AND PREVIOUS INVESTIGATIONS	2
2.3 PHYSICAL SETTING	3
3.0 SITE ACTIVITIES	4
3.1 WELL INSTALLATIONS	4
3.2 GROUNDWATER SAMPLING	6
3.3 QUALITY ASSURANCE/QUALITY CONTROL SAMPLING	7
3.4 DECONTAMINATION	7
3.5 INVESTIGATION-DERIVED WASTE	8
4.0 ANALYTICAL DATA SUMMARY	9
4.1 GROUNDWATER SAMPLE RESULTS	9
4.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLING	9
5.0 DEVIATIONS FROM THE SAP AND QAPP	10
6.0 CONCLUSIONS	11
7.0 REFERENCES	12

CONTENTS (Continued)

APPENDICES

Appendix

- A FIGURES
- B PHOTOGRAPHIC LOG
- C FIELD LOGBOOK
- D FIELD SHEETS AND CHAIN OF CUSTODY
- E ANALYTICAL DATA
- F BORING LOGS
- G MONITORING WELL CONSTRUCTION FORMS
- H MONITORING WELL DEVELOPMENT FORMS
- I MONITORING WELL SURVEY DATA

TABLES

<u>Table</u>		<u>Page</u>
1	MONITORING WELL LOCATIONS	6
2	SUMMARY OF SAMPLES	7
3	SUMMARY OF SAMPLE RESULTS	9

EXECUTIVE SUMMARY

The Toeroek Associates, Inc. (Toeroek) Team received Task Order No. 035 from the U.S. Environmental Protection Agency (EPA), under Contract No. EP-W-13-002, to provide assistance to Resource Conservation and Recovery Act (RCRA) state and federal program staff in EPA Region 7. Specifically, under Technical Directive No. 8 in Option Year 4 for this task order, EPA Region 7 requested that the Toeroek Team (which includes the Toeroek Team subcontractor Tetra Tech, Inc. [Tetra Tech]), as part of a groundwater sampling investigation, install two permanent monitoring wells downgradient of the former Electrolux, Inc. (Electrolux) facility (the facility) in Jefferson, Iowa.

Investigation activities occurred May 21 through 25, 2018. The purpose of the sampling investigation was to determine if facility-related contamination had migrated downgradient toward City of Jefferson municipal water supply wells.

The Toeroek Team collected groundwater samples from the two newly installed monitoring wells downgradient of the facility. Based on data acquired during the sampling investigation, no facility-related contamination was found; however, minor amounts of chloroform were detected in samples collected at MW-1 (3.1 micrograms per liter [$\mu\text{g/L}$]) and MW-2 (6.4J $\mu\text{g/L}$ and 8.1 $\mu\text{g/L}$ [field duplicate]). In no sample did the chloroform concentration exceed the maximum contaminant level (MCL) of 80 $\mu\text{g/L}$. The chloroform may be attributed to the use of chlorinated municipal water during the drilling process, or it could have been a laboratory contaminant.

1.0 INTRODUCTION

The Toeroek Associates, Inc. (Toeroek) Team received Task Order No. 035 from the U.S. Environmental Protection Agency (EPA), under Contract No. EP-W-13-002, to provide assistance to Resource Conservation and Recovery Act (RCRA) state and federal program staff in EPA Region 7. Specifically, under Technical Directive No. 8 in Option Year 4 for this task order, EPA Region 7 requested that the Toeroek Team (which includes the Toeroek Team subcontractor Tetra Tech, Inc. [Tetra Tech]), as part of the groundwater sampling investigation, install two permanent monitoring wells downgradient of the former Electrolux, Inc., (Electrolux) facility (the facility) in Jefferson, Iowa (see Appendix A, Figure 1).

As directed by the Technical Directive Performance Work Statement for Technical Directive No. 3 in Option Year 3 for this task order, the Toeroek Team had previously developed a Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) for the groundwater sampling investigation near the facility. Subsequent field implementation of the SAP and QAPP was completed in conformance to Technical Directive No. 8 in Option Year 4 for this task order. This report summarizes facility background information, field sampling techniques, and analytical results from the EPA Region 7 laboratory.

1.1 PURPOSE OF REPORT

The intent of this report is to chronicle installation, development, and sampling of two permanent monitoring wells downgradient of the facility. The purpose of the sampling investigation was to determine if potential facility-related contamination had migrated downgradient toward City of Jefferson municipal wells.

1.2 REPORT ORGANIZATION

The format of this report complies with requirements outlined in Section 1.0 of the Toeroek Team's "Programmatic Quality Assurance Project Plan, Revision 00," prepared for EPA Region 7 under Contract No. EP-W-13-002 (Toeroek 2013). The report is organized as follows: Section 1.0 presents introductory information, Section 2.0 discusses facility background, Section 3.0 describes site activities, Section 4.0 discusses analytical data, Section 5.0 identifies any deviations from the SAP and QAPP, Section 6.0 summarizes conclusions, and Section 7.0 lists references cited in the report.

2.0 SITE BACKGROUND

This section briefly describes the facility location and demographics, the history of facility operations and regulatory history, and physical conditions in the area of the facility.

2.1 SITE LOCATION

The former Electrolux facility is at 601 East Central Avenue in Jefferson, Greene County, Iowa. The facility lies within the southeast quarter of Section 5, Township 83 North, Range 30 West (see Appendix A, Figure 1). The facility occupies an approximately 20.75-acre parcel zoned for industrial use (Greene County, Iowa Assessor's Office 2016).

2.2 HISTORICAL SITE USE AND PREVIOUS INVESTIGATIONS

The 20.75-acre Electrolux property formerly included a 75,500-square-foot facility used for manufacture of dishwasher motor transmissions from 1960 until decommissioned in March 2011. The manufacturing building was demolished; all that now remains is a 7.5-acre area of concrete building slabs, parking lots, fencing, and sidewalks where manufacturing activities previously occurred (see Appendix A, Figure 2). In 2010, Electrolux began to assess possible presence of subsurface contamination derived from manufacturing activities. A phased site assessment approach was followed from 2010 through 2013 to assess facility subsurface soil and groundwater conditions downgradient of and in areas exterior to the former manufacturing area. Additional groundwater monitoring occurred in 2014, and a Site Assessment and Summary Report that included a conceptual site model was completed in October 2016 (Golder Associates, Inc. [Golder] 2016).

Results from the site assessments indicated that soil and groundwater at the facility were contaminated with chlorinated volatile organic compounds (CVOC), primarily trichloroethene (TCE) and its breakdown constituents, within glacial tills (identified between 0 and 40 feet below ground surface [bgs]). CVOC-impacted soils were found only within the footprint of the former facility and adjacent landscaped areas, within 1 to 7 feet bgs. Highest concentrations of CVOCs in groundwater were detected in the yellow brown till within approximately 30 to 40 feet bgs near the southeast portion of the former facility. The October 2016 Site Assessment report concluded that natural attenuation and chlorinated degradation were occurring at the facility, and that the extent of contamination was confined within Electrolux property boundaries. Sources of volatile organic compound (VOC) contamination at the facility are believed to be former manufacturing operations within the eastern portion of the facility (Golder 2016).

An additional investigation completed in April 2017 included collection of groundwater samples at downgradient locations by use of a direct-push technology (DPT) drilling rig. No VOCs were detected in any of the samples collected during the sampling event. (Toeroek 2017).

2.3 PHYSICAL SETTING

The former Electrolux facility is in an industrial and agricultural area on the northeast side of Jefferson, Iowa. Within the fenced perimeter of the former facility property is a mix of concrete building slabs, sidewalks, paved parking lots, and landscaped areas. The facility is bordered to the north by East Central Avenue, east by agricultural cropland, and south and west by Union Pacific Railroad tracks. Adjacent properties to the north and east are agricultural, and include several grain storage and processing facilities. Properties to the south and west are primarily agricultural and residential.

The facility is at a surface elevation of approximately 1,050 feet above mean sea level. Regional topography slopes to the south-southeast toward Hardin Creek (U.S. Geological Survey [USGS] 1986).

Documents obtained from the Jefferson Water Department Source Water Protection Plan indicate that the southwest portion of the former facility is within the 10-year capture zone of four of the six Jefferson water supply wells screened in a Pleistocene sand and gravel complex at approximately 150 feet bgs (Tetra Tech 2016).

3.0 SITE ACTIVITIES

The Toeroek team installed two permanent monitoring wells and conducted sampling activities downgradient of the facility from May 21 through 25, 2018, to determine if potential facility-related contamination had migrated downgradient toward City of Jefferson municipal wells. The SAP and QAPP called for installation and development of two permanent monitoring wells, collection of two groundwater samples from each well using micro-purge ("low-flow") sampling methodology, and a survey of each well to determine accurate global positioning system (GPS) coordinates, as well as elevations of the ground surface and top of casing in feet above mean sea level (AMSL).

The following sections describe sampling investigation activities. Photographic documentation is in Appendix B, and a site-specific field logbook is in Appendix C.

3.1 WELL INSTALLATIONS

EPA tasked the Toeroek team to install two permanent monitoring wells in order to determine if potential contamination from the former Electrolux facility has migrated downgradient and into the Pleistocene sand and gravel complex that supplies the City of Jefferson municipal water wells at approximately 150 feet bgs.

Drilling, installation, and development of the monitoring wells was completed by Cascade Drilling, L.P. of Schofield, Wisconsin, by use of rotary sonic technology. Well construction consisted of 2-inch inner diameter (I.D.), schedule 40 polyvinyl chloride (PVC) risers and screens. Screen lengths were 10 feet with 0.01-inch slot size. Sand pack consisted of Red Flint #40-mesh silica sand. Cetco 3/8" bentonite pellets were used to seal the wells, and a Portland cement and bentonite grout mixture was added to approximately 1 foot bgs. All wells were flush-mount completed.

Well Installation

MW-1 was installed within the city right-of-way approximately 20 feet east of North Cedar Street and 100 feet south of the Union Pacific Railroad. The boring for MW-1 was advanced entirely via rotary sonic technology to total depth of 150 feet bgs. The boring was backfilled with bentonite to 100 feet bgs, with an additional 2 feet of #40-mesh silica sand, before placement of the screen from 88 to 98 feet bgs in a silty, clayey, well-sorted medium to coarse-grained sand.

MW-2 was installed within the city right-of-way on the north side of East Adams Street approximately 1,700 feet east of North Cedar Street. The boring for MW-2 was advanced entirely via rotary sonic technology to total depth of 150 feet bgs. The boring was backfilled with bentonite to 134 feet bgs, with an additional 2 feet of #40-mesh silica sand, before placement of the screen from 123 to 133 feet bgs in very fine to fine-grained buff sand.

Well Development

After allowance of 24 hours for the grout to set, the monitoring wells were developed via a combination of pumping and surging. Primary goals of the well development process were to (1) remove water used during the drilling process; (2) ensure that groundwater could pass through well screens unobstructed, thereby generating representative groundwater samples and accurate water level measurements; and (3) remove very fine-grained particles from the filter pack and surrounding subsurface sediments to prevent siltation of the wells and to preclude turbidity in future groundwater samples.

A submersible purging pump was used to develop each well. The pump was lowered to a position approximately 3 feet above the bottom of the well. At 10-minute intervals, the pump was pulled about 20 feet toward the surface and re-lowered to surge the well. Development would continue until the volumes of water added to the augers in the course of drilling had been removed, the water was visually clear, and water quality testing parameters (temperature, conductivity, pH, dissolved oxygen [DO], oxidation-reduction potential [ORP], and turbidity) had stabilized within 10 percent in three consecutive readings. Total volumes of water added during the drilling process were not removed from MW-1 and MW-2. Water quality testing parameters were not collected at MW-1 due to low recharge rate. Further details regarding these deviations are provided in Section 5 of this report.

Bolton & Menk of Jefferson, Iowa was subcontracted to survey horizontal and vertical coordinates of the newly installed wells following completion. Table 1 lists well numbers, well depths, screen intervals, and survey data pertaining to the newly installed monitoring wells.

TABLE 1
MONITORING WELL LOCATIONS
FORMER ELECTROLUX, INC. FACILITY – JEFFERSON, IOWA

Well Number	Well Depth (ft bgs)	Screen Interval (ft bgs)	Location		Elevation
			Latitude	Longitude	Ground (ft amsl)
MW-1	98	88-98	42° 1' 21.77881"	- 94° 22' 9.47792"	1186.93
MW-2	132	123-133	42° 1' 5.92272"	- 94° 21' 47.99284"	1189.18

Notes:

amsl	Above mean sea level	ft	Feet
bgs	Below ground surface	MW	Monitoring well

3.2 GROUNDWATER SAMPLING

The Toeroek Team collected groundwater samples from the monitoring wells (MW-1 and MW-2) following completion and development (see Appendix A, Figure 3). At MW-1, samples were collected within the screened interval of 88 to 98 feet bgs. Samples from MW-2 were collected within the screened interval of 123 to 133 feet bgs.

Water quality testing parameters (temperature, conductivity, pH, DO, ORP, and turbidity) were measured during well development by use of a Horiba multiparameter water quality meter, and were recorded onto micropurge groundwater sampling data sheets (Appendix H). Parameters were considered stabilized when values fluctuated no more than 10 percent over three consecutive readings. The wells were then sampled by use of low-flow QED Micropurge equipment. A bladder pump was lowered to the bottom of the well, raised 3 feet into the middle of the screen, and secured in place with hose clamps, and the pumping rate was set to 200 milliliters per minute.

Each groundwater sample was collected for analysis for VOCs into a 40-milliliter (mL) volatile organic analyte (VOA) vial preserved with hydrochloric acid (HCl). Sample vials were labeled and packaged accordingly—placed in a cooler maintained at or below a temperature of 4 degrees Celsius (°C) until submitted for analysis to the EPA Region 7 laboratory on May 29, 2018, under Analytical Services Request (ASR) 7817. Pertinent data, including sample locations and analyses to be performed, were recorded on field sheets (see Appendix D). Table 2 below summarizes sample locations, identification numbers, depths, and laboratory analyses.

TABLE 2
SUMMARY OF SAMPLES
FORMER ELECTROLUX, INC. FACILITY, JEFFERSON, IOWA

Sample Location	EPA Sample ID	Screen Interval (ft bgs)	Analyses
MW-1	7817-2	88-98	VOCs
MW-2	7817-1	123-133	
	7817-1-FD		
Trip blank	7817-4-FB	N/A	
Field blank	7817-5-FB		

Notes:

°N Decimal degrees North
 °W Decimal degrees West
 FD Field duplicate
 ft bgs Feet below ground surface
 ID Identification
 N/A Not applicable
 VOC Volatile organic compound

3.3 QUALITY ASSURANCE/QUALITY CONTROL SAMPLING

Field quality control (QC) sampling for this sampling investigation included a laboratory-supplied aqueous trip blank. Analytical data from the trip blank were referenced to determine whether contamination had been introduced during transportation of the containers and samples. Additional QC sampling consisted of collecting a field blank. The field blank sample was analyzed to assess field-introduced and laboratory-introduced contamination. One field duplicate sample collected from MW-2 was also submitted to evaluate total method precision. Table 2 above summarizes QC samples collected during the sampling investigation.

3.4 DECONTAMINATION

Drilling operations included use of a temporary equipment decontamination pad and staging area at the Jefferson City Water Plant at 1000 N Cedar Street. The Toeroek Team decontaminated micro-purge sampling equipment prior to first use and after sampling at each location. Decontamination consisted of thoroughly scrubbing the equipment with a non-phosphate detergent solution, and rinsing the equipment with deionized water. Decontamination of additional sampling equipment was not necessary because all other sampling equipment was disposable.

3.5 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) consisted of expendable sampling supplies, personal protective equipment (PPE), disposable tubing, and drill cuttings. Because well locations were in areas where only groundwater contamination was anticipated, soils were loaded onto a trailer and transported to the Metro Park West Landfill in Perry, Iowa, for disposal. Purge water was containerized in a 330 gallon plastic polyethylene tote tank and disposed of at the City of Jefferson Water Department. Expendable sampling materials and PPE were disposed of as municipal solid waste.

4.0 ANALYTICAL DATA SUMMARY

During field activities conducted from May 21 through 25, 2018, the Toeroek Team collected groundwater samples to assess the possible presence of downgradient contamination related to historical facility operations. Samples were submitted to the EPA Region 7 laboratory in Kansas City, Kansas, for analysis. The following sections summarize analytical results from the sampling investigation. Field sheets and Chain-of-custody forms are in Appendix D, and the analytical data package is in Appendix E.

4.1 GROUNDWATER SAMPLE RESULTS

The Toeroek Team collected groundwater samples from groundwater monitoring wells installed at MW-1 and MW-2 (see Appendix A, Figure 3). Table 3 summarizes VOC sampling results. The VOC analyte chloroform was detected in all monitoring well samples. The sample collected at MW-1 contained chloroform at 3.1 µg/L. Samples collected at MW-2 contained chloroform at 6.4 J µg/L and 8.1 µg/L (field duplicate). The J code (indicating an acceptable estimated value) for one of the chloroform results from MW-2 was applied due to low recovery of the analyte in the laboratory matrix spike. In no sample did the chloroform concentration exceed the maximum contaminant level (MCL) of 80 µg/L.

TABLE 3
SUMMARY OF SAMPLE RESULTS
FORMER ELECTROLUX, INC. FACILITY, JEFFERSON, IOWA

Sample Location	EPA Sample ID	Screen Interval (ft bgs)	Chloroform
			Concentration (µg/L)
MW-1	7817-2	88-98	3.1
MW-2	7817-1	123-133	6.4 J
	7817-1-FD		8.1
Trip blank	7817-4-FB	N/A	1.0 U
Field blank	7817-5-FB		1.0 U

Notes:

bgs Below ground surface
FD Field duplicate
ft Feet
J Estimated value

MW Monitoring well
µg/L Micrograms per liter

4.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLING

QC samples collected during the sampling investigation included one aqueous trip blank, one field duplicate sample, and one field blank sample. Chloroform was detected at 8.1 µg/L in the field duplicate sample collected at MW-2. No VOCs were detected in the trip blank or field blank samples.

5.0 DEVIATIONS FROM THE SAP AND QAPP

The following deviations from the EPA-approved SAP and QAPP occurred, and were communicated to the EPA Task Order Contracting Officer's Representative (TOCOR):

- MW-1 was screened from 88 to 98 feet bgs due to geologic conditions. At approximately 104 feet bgs, an impermeable grey shale was encountered. Following consultation with the EPA TOCOR, it was decided to continue drilling to 150 feet bgs. The grey shale was followed by interchanging layers of limestones, sandstones, and coal layers before returning to shale from 135 to 150 feet bgs. No significant sand and gravel was encountered. Upon further consultation with the TOCOR, MW-1 was screened from 88 to 98 feet bgs at the deepest interval thought to be viable for groundwater production.
- MW-2 was screened from 123 to 133 feet bgs due to geologic conditions. At approximately 134 feet bgs, an impermeable grey shale layer was encountered. Following consultation with the EPA TOCOR, it was decided to continue drilling to 150 feet bgs. The grey shale was underlain by a sub-bituminous coal layer from 144.5 to 149.5 feet bgs before returning to shale at 150 feet bgs. Upon further consultation with the TOCOR, MW-2 was screened from 123 to 133 feet bgs in a buff, very fine- to medium-grained, moist sand.
- Total volume of water used during construction of MW-1 was approximately 1,500 gallons. During development, MW-1 was purged dry after approximately 15 gallons. The well was allowed to recharge and the pumping rate was lowered to 0.1 gallon per minute (gal/min). Recharge was calculated to be approximately 0.08 gal/min. Due to the minimal recharge rate, MW-1 could not be developed as proposed in the QAPP, and water quality parameters were unable to be collected.
- Total volume of water used during construction of MW-2 was approximately 1,200 gallons. Due to the considerable amount of time that would have been required to remove the total volume of drilling fluids, development of MW-2 was concluded once water quality parameters had stabilized and following removal of approximately 350 gallons of water after approximately 4 hours of pumping at the maximum rate attainable of 1.5 gal/min.

6.0 CONCLUSIONS

The Toeroek Team received Task Order No. 035 from EPA, under Contract No. EP-W-13-002, to provide assistance to RCRA state and federal program staff in EPA Region 7. Under Technical Directive No. 8 in Option Year 4 for this task order, EPA Region 7 requested that the Toeroek Team, as part of the groundwater sampling investigation, install two permanent monitoring wells downgradient of the former Electrolux, Inc. facility in Jefferson, Iowa.

From May 21 through 25, 2018, investigation activities proceeded to determine whether facility-related contamination had migrated downgradient toward City of Jefferson municipal wells. The Toeroek Team installed and sampled groundwater monitoring wells downgradient of the facility.

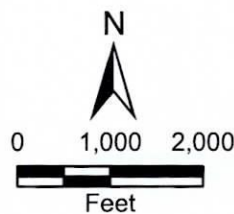
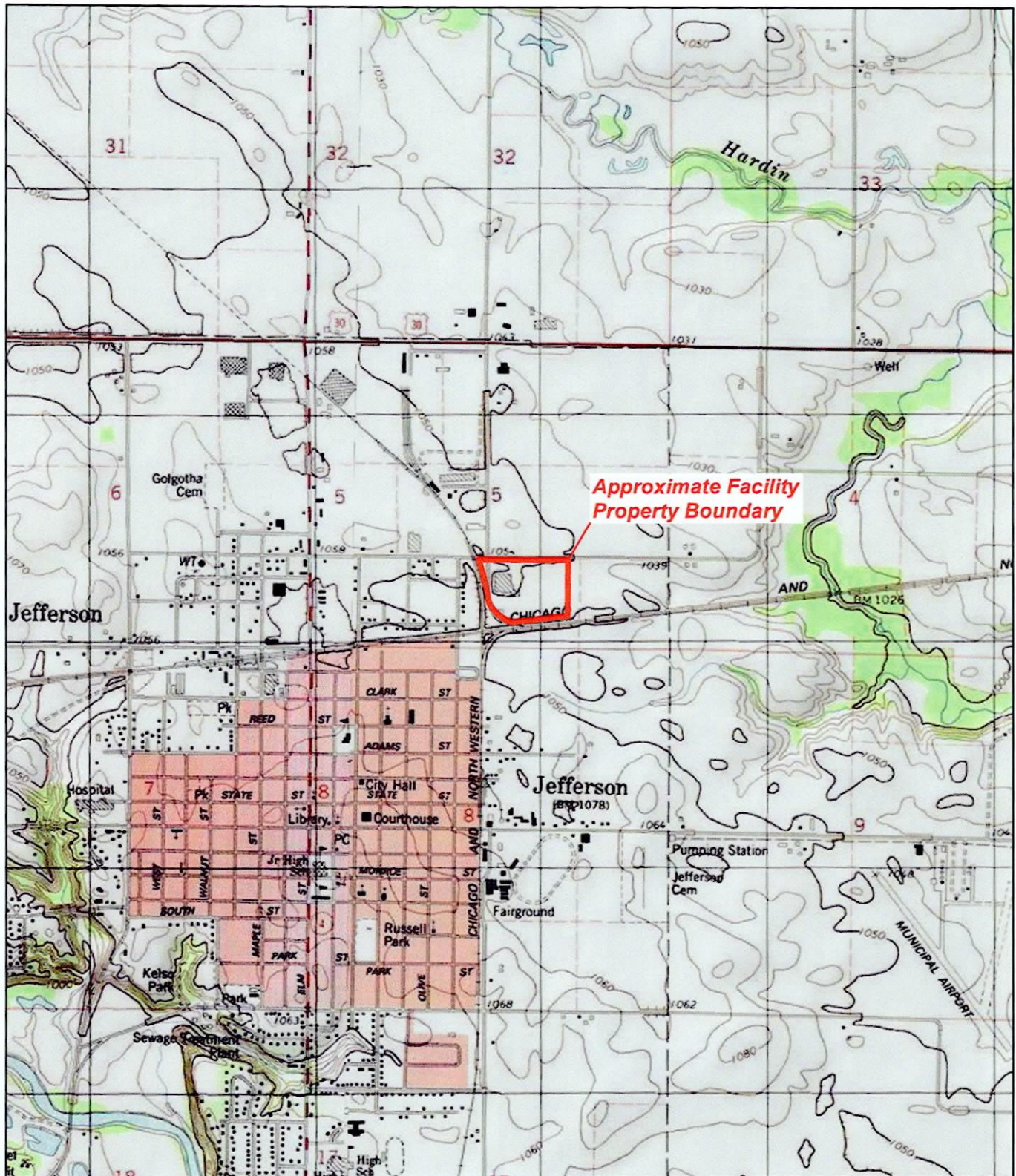
Based on data acquired during the sampling investigation, no facility-related contamination was found at downgradient sample locations; however, minor amounts of chloroform were detected in samples collected at MW-1 (3.1 µg/L) and MW-2 (6.4J µg/L and 8.1 µg/L [field duplicate]). In no sample did chloroform concentration exceed the maximum contaminant level (MCL) of 80 µg/L. The minimal quantities of chloroform found in the monitoring well samples may be attributed to the use of chlorinated municipal water used during the drilling process, or it could be a laboratory contaminant.

7.0 REFERENCES

- Golder Associates, Inc. (Golder). 2016. Site Assessment Summary Report, Former Electrolux Home Products, Inc. Facility, Jefferson, Iowa. October.
- Greene County, Iowa Assessor's Office. 2016. Online Parcel Report. Accessed November 15, 2016. <http://greeneia.mygisonline.com/>
- Tetra Tech, Inc. (Tetra Tech). 2016. Personal communication regarding Jefferson supply wells. From Brian Mitchell, U.S. Environmental Protection Agency (EPA) Region 7. To Kirk Mammoliti, Tetra Tech. November 16, 2016.
- Toeroek Associates. (Toeroek). 2017. "Former Electrolux Inc. Facility Groundwater Sampling Event Final Report of Findings, Revision 01". Prepared for EPA Region 7 under Contract No. EP W 13-002. June.
- Toeroek. 2013. "Programmatic Quality Assurance Project Plan, Revision 00." Prepared for EPA Region 7 under Contract No. EP-W-13-002. July.
- U.S. Geological Survey (USGS). 1986. Jefferson East, Iowa Quadrangle. 7.5-Minute Topographic Series.

APPENDIX A

FIGURES



Former Electrolux, Inc. Facility
601 East Central Avenue
Jefferson, Iowa

Figure 1
Site Location Map



Source: Jefferson West, Iowa USGS 7.5 Minute Topo Quad, 1986;
Jefferson East, Iowa USGS 7.5 Minute Topo Quad, 1986.

Date: 11/17/2016

Drawn By: Nick Wiederholt

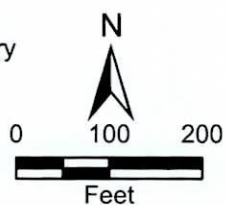
Project No: 1032642035 44.04

X:\P\2642035\Project3\mxd\Figure1.mxd



Legend

- Approximate facility property boundary
- Former manufacturing area






Former Electrolux, Inc. Facility
601 East Central Avenue
Jefferson, Iowa

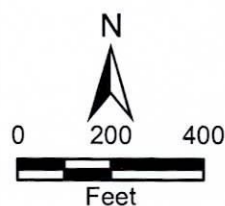
Figure 2 Site Layout Map





Legend

-  Monitoring well location
-  Approximate facility property boundary
-  Former manufacturing area



Former Electrolux, Inc. Facility
601 East Central Avenue
Jefferson, Iowa

Figure 3
Monitoring Well Location Map



APPENDIX B
PHOTOGRAPHIC LOG

Former Electrolux, Inc. Facility Jefferson, Iowa



TETRA TECH PROJECT NO. 103G2642035.48.04 Direction: Northeast	DESCRIPTION	This photograph shows the location of MW-2.	1
			Date 5/21/2018
	PHOTOGRAPHER	Kirk Mammoliti	



TETRA TECH PROJECT NO. 103G2642035.48.04 Direction: Southwest	DESCRIPTION	This photograph shows the location of MW-1.	2
			Date 5/23/2018
	PHOTOGRAPHER	Kirk Mammoliti	

Former Electrolux, Inc. Facility Jefferson, Iowa



TETRA TECH PROJECT NO. 103G2642035.48.04	DESCRIPTION	This photograph shows the completed flush mount at MW-2.	3
			Date 5/25/2018
Direction: Northeast	PHOTOGRAPHER	Kirk Mammoliti	



TETRA TECH PROJECT NO. 103G2642035.48.04	DESCRIPTION	This photograph shows the monitoring well being developed at MW-1.	4
			Date 5/25/2018
Direction: Southeast	PHOTOGRAPHER	Kirk Mammoliti	

APPENDIX C
FIELD LOGBOOK

KS1614



Rite in the Rain

ALL-WEATHER

LEVEL

Nº 311FX

Electrolux Facility

Jefferson, Iowa

103 G 26 4035-44.04.06

103 G 26 4035⁺-48.04

The logo for Rite in the Rain is a yellow rectangular label with rounded corners and a black border. At the top, it says "MADE IN TACOMA" in a small, black, sans-serif font. Below that, in a slightly larger black sans-serif font, is "— SINCE 1918 —". The center of the label features the brand name "Rite in the Rain" in a large, elegant, black script font. At the bottom, it reads "— DEFYING MOTHER NATURE —" in a black sans-serif font, matching the top text.

Name Tetra Tech, Inc.

Address 415 Oak Street

Kansas City, MO 64106

Phone 816-412-1741

Project Electrodex Facility

Tefferson, Iowa

G264035.44.04.06



RiteintheRain.com

4-11-2017

0800 - Departed hotel for E. Adams St to attempt advancing beyond 80' bgs.

0815 - Arrived @ site + began pushing @ GW-2

0840 - Collected Linsate sample 7455-6

0850 - Collected Field blank sample 7455-7-FB

0900 - Encountered refusal @ 77' bgs

- Began cleanup

0950 - Collected Trip Blank 7455-18-FB

1000 - Departed site for R7 Lab

1400 - Returned to Tetra Tech office to make copies of field sheets

1515 - Delivered samples to R7 lab.

1530 - End of day

[Signature]
4-11-2017

5-21-2018

0600 - Departed Tetra Tech office. K. Mammalis + L. Holt serving as field personnel.

0940 - Arrived @ Hy-Vee in Jefferson, IA + met w/ Cascade Drilling field crew.

1030 - Determined crew would stage rigs @ Jefferson WWTP lot.

1100 - Began set-up @ MW-2 @ east end of Adams

1200 - Lunch

1330 - Began drilling @ MW-2

1430 - Hydraulic leak - crew working to repair

~~1630~~ 1715 - Resumed boring @ MW-2

1830 - Quit boring @ 75'. Began cleanup

1900 - End of day

[Signature]
5-21-18

5-22-18

0700. Arrived on-site to continue boring @ MW-2 on east end of E. Adams St.

- Weather forecasted to be sunny, humid, in the upper 80s.

0715. Resumed boring @ MW-2

1115. Identified shale layer @ bottom of 135' w/ wet sand + gravel above. Called TOCOR Mitchell to discuss potentially setting screen from 125-135' to capture groundwater in well. Determined field team will continue to core into shale layer to 150' + decide if groundwater is available @ such depth. If not, crew will plug up to top of shale + screen in sand/gravel unit.

1130. Cascade Crew mobilized for more drilling water.

1145. Lunch

1230. Began boring @ MW-2

1310. Reached ~~130' depth~~ 140' depth. Confirmed w/ TOCOR Mitchell that 150' would likely not produce water + that plan remained to screen from 125-133 w/in sand + gravel unit. Will push to 150' for geologic logging purposes.

1420. Reached 151'

- Began prep for setting well

1450. L. Mamueliti departed for Carrollton to retrieve CO₂

1630. Returned to site from Carroll. Crew has completed well up to the point of grouting. Will grout MW-2 first thing in morning on Wednesday.

1700. End of Day

[Signature]
5-22-18

5-23-18

0700 - Arrived on site. Cascade crews continuing installation of monitoring well #2. - currently grouting well.

0725 - Completed grouting, began pulling up casing.

0750 - Completed pulling casing, began cleanup.

0830 - Completed cleanup; crews mobilized for water.

0900 - Began staging equipment @ MW-1 location on east side of N. Cedar, south of RR Crossing.

0955 - Began drilling @ MW-1

1145 - Lunch - ended @ 75'

1220 - Resumed boring @ MW-1

1430 - Encountered shale from 102'-115'

Reviewed many nearby logs to determine if conditions are typical. No significant sand and gravel layer was encountered during boring. A nearby well ~0.25 mile west showed similar conditions.

1450 - Called TOCOR Mitchell to discuss.

Was informed crew should drill to 150' to confirm impermeable shale layer is present to such depth.

1530 - Resumed boring.

1545 - Mammoliti departed for Carroll to retrieve

additional bentonite necessary to plug boring up to ~90' where well is planned to be screened (i.e. decent sand layer present @ that depth.)

1640 - Mammoliti returned

1710 - Completed boring to ~150' (shale + sandstone)

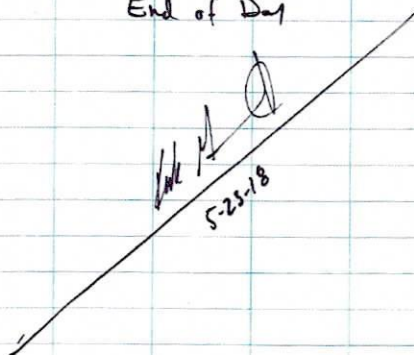
1730 - finished cleanup - will complete well tomorrow. Intend to backfill boring + install screen from 88'-98'.

1735 - Departed back to Carroll to retrieve remainder of bentonite purchased for Cascade.

1800 - Arrived @ Briggs to pick up remainder of bentonite.

1830 - Finished loading bentonite.

End of Day



Rite in the Rain

(5-24-18)

0645. Arrived on site Crews continuing to backfill MW-1
- 0720 - Backfilled to 98' + began setting well.
- 0740 - Pulled casing
- 0815 - Drill crew mobilized for cement.
- 0915 - Grouted well
+ Spoke with Tom Schilling w/ City of Jefferson water department + collected recent sampling data for individual City municipal wells
- 1015 - Crew completed well + began cleanup
- 1045 - Met w/ Todd - property owner east of ROW.
+ Will discuss compensation for lost hay as City did not mow per Monday's request.
- 1115 - Departed site
- 1130 - Picked up low-flow supplies @ hotel
- 1145 - Lunch
- 1220 - Arrived @ MW-2 location. Cascade crew prepping to complete well pad + vault.
- 1240 - Partial crew departed MW-2 to dispose of cuttings @ Metro Park West Landfill in Perry, IA.
- 1320 - Cascade crew w/o tubing for development - searching now for tubing
- 1515 - Began developing MW-2
= Currently pumping @ 1.5 gpm
- 1600 - Surged well

- 1620 - Surged well
- 1640 - Surged well
- 1710 - Surged well
- 1730 - Surged well
- 1800 - Surged well
- 1810 - Began collecting WQ parameters
- 1855 - Water quality stable
- 1857 - Collected 7817-1, 7817-1-FD, + MS/MSD.
- 1900 - Mobilized
- 1915 - End of day

End M. Ob
5-24-18

5-25-18

0730 - Departed hotel - Cascade Creek w/o
concrete + trowel to construct surface
completions

0815 - Crews completed pads

- From BTOC @ MW-2

TD = 133.95

SWL = 53.71

0900 - Will wait for 24 hour grout setting

0940 - Delivered well lock key to Brian @
Bolton-Mank to perform as-built survey on
Tuesday

1015 - Began development

- Pumping @ 1.5 gallons/min

1018 - Well dry?

- Indicates water level @ 54'

- Resetting development pump

1025 - Resumed pumping well - pump set too high

1035 - Flow has slowed significantly (0.25-0.5 gpm)

SWL dropped to > 93.5'

SWL = 96.4

1110 - Recharge calculated ~0.08 gallon per minute

- Developing well @ 0.1 gpm

- Driller only ~~lost~~ lost well volume worth fluid
during drilling

1145 - Well dry

1225 - Surged well

1230 - Began pumping well

1235 - Well dry

1310 - Surged + pumped

1315 - Well dry

1335 - Turned on pump to sample as MW-1
will likely not classically develop in
screened formation

1345 - Collected parameters + sample
(F817-2)

1400 - Cleaned up + departed for Carroll
to return CO₂

1430 - Returned CO₂ bottle - departed for office

1845 - Arrived @ Tetra Tech office

Rite in the Rain

1530: ¹⁵⁻²⁹⁻¹⁸ Delivered Samples R7 laboratory

APPENDIX D
FIELD SHEETS AND CHAIN OF CUSTODY

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7817 Sample Number: 1 QC Code: ____ Matrix: Water Tag ID: 7817-1-__

Project ID: BMEJIARCRA **Project Manager:** Brian Mitchell
Project Desc: Electrolux GW RCRA site investigation sampling
City: Jefferson **State:** Iowa
Program: RCRA Corrective Action

Location Desc: @ MW-2 @ east end of Adams Street

Storet ID: _____ **External Sample Number:** _____

Expected Conc: _____ (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 42.01832

Sample Collection: Start: 5/24/18 18:57

Longitude: -94.36333

End: ____/____/____ :__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments:

(N/A) @ MW-2

Includes MS/MSD

bTOC SWL = 53.71'
TD = 133.95'

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7817 Sample Number: 3 QC Code: __ Matrix: Water Tag ID: 7817-~~8~~ FD

Project ID: BMEJIARCRA Project Manager: Brian Mitchell
Project Desc: Electrolux GW RCRA site investigation sampling
City: Jefferson State: Iowa
Program: RCRA Corrective Action

Location Desc: @MW-2 near east end of Adams St

Storet ID: _____ External Sample Number: _____

Expected Conc: _____ (or Circle One: Low Medium High) Date Time(24 hr)

Latitude: 42.01832

Sample Collection: Start: 5/24/18 18:57

Longitude: -94.36333

End: / / :

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments:

(N/A)

@MW-2

* Field Duplicate

SWL = 53.71'
BTAC TD = 133.95'

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7817 Sample Number: 2 QC Code: ____ Matrix: Water Tag ID: 7817-2-__

Project ID: BMEJIARCRA **Project Manager:** Brian Mitchell
Project Desc: Electrolux GW RCRA site investigation sampling
City: Jefferson **State:** Iowa
Program: RCRA Corrective Action

Location Desc: @ MW-1 along east side of N. Cedar St

Storet ID: _____ **External Sample Number:** _____

Expected Conc: _____ (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 42.0227666

Sample Collection: Start: 5/25/18

13:45

Longitude: -94.364362

End: __/__/__

__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments:

(N/A)

@MW-1

BTCL-FD = 98.5'

Sample Collected By: TT

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 7817 **Sample Number:** 4 **QC Code:** FB **Matrix:** Water **Tag ID:** 7817-4-FB

Project ID: BMEJIARCRA **Project Manager:** Brian Mitchell
Project Desc: Electrolux GW RCRA site investigation sampling
City: Jefferson **State:** Iowa
Program: RCRA Corrective Action

Location Desc: LDL VOA Trip Blank

Storet ID: _____ **External Sample Number:** _____

Expected Conc: _____ (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: _____ **Sample Collection: Start:** 5/25/18 14:30

Longitude: _____ **End:** ____/____/____ ____:____

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments:

Prepared by the LTAB.

Trip Blank

Sample Collected By: TT

Sample Collection Field Sheet

US EPA Region 7

Kansas City, KS

ASR Number: 7817 Sample Number: QC Code: FB Matrix: Water Tag ID: 7817-5-FB

Project ID: BMEJIARCRA

Project Manager: Brian Mitchell

Project Desc: Electrolux GW RCRA site investigation sampling

City: Jefferson

State: Iowa

Program: RCRA Corrective Action

Location Desc: LDL VOA ~~Field~~ Blank

Storet ID: _____

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High)

Date

Time(24 hr)

Latitude: _____

Sample Collection: Start: 5/25/18

14:45

Longitude: _____

End: / /

 :

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs In Water by GC/MS for Low Detection Limits

Sample Comments:

Prepared in field by Tetra Tech

* Field Blank

Sample Collected By: TT

EPA PROJECT MANAGER (Print) B. Mitchell (RCRA)	SITE OR SAMPLING EVENT Electrolut GW RCRA, Tetterton, IA	DATE OF SAMPLE COLLECTION(S) 5 24-25 2018 MONTH DAY YEAR	SHEET 1 of 1
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[illegible]

<u>7</u> CONTAINER(S) CONSISTING OF _____ CRATE(S)	_____ COMMERCIAL CARRIER _____
X ICE CHEST(S): OTHER _____	X SAMPLER CONVEYED _____ (SHIPPING AIRBILL NUMBER)

RELINQUISHED BY (PM/SAMPLER) <i>E. Mammoliti</i>	DATE <i>5-21-18</i>	TIME <i>1530</i>	RECEIVED BY <i>North Pole</i>	DATE <i>5/24/18</i>	TIME <i>1530</i>	REASON FOR CHANGE OF CUSTODY <i>Arrest</i>
SEALED UNSEALED			SEALED UNSEALED			
RELINQUISHED BY (PM/SAMPLER)	DATE	TIME	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED			
RELINQUISHED BY (PM/SAMPLER)	DATE	TIME	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED			
RELINQUISHED BY (PM/SAMPLER)	DATE	TIME	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED			

APPENDIX E
ANALYTICAL DATA

**United States Environmental Protection Agency
Region 7
300 Minnesota Avenue
Kansas City, KS 66101**

Date: 06/19/2018

Subject: Transmittal of Sample Analysis Results for ASR #: 7817

Project ID: BMEJIARCRA

Project Description: Electrolux GW RCRA site investigation sampling

From: Margaret E.W. St. Germain, Chief
Laboratory Technology & Analysis Branch
Environmental Sciences & Technology Division

To: Brian Mitchell
AWMD/WRAP

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please ensure that you file this electronic (.pdf only) transmittal in your records management system. The Regional Laboratory will now retain all of the original hardcopy documentation (e.g. COC[s] and the R7LIMS field sheet[s], etc.) according to our ENST records management system.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the Online ASR Sample/Data Disposition and Customer Survey for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Online ASR Sample/Data Disposition and Customer Survey. It is critical that we receive your response in accordance to RCRA and the laboratory accreditation.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

Project Manager: Brian Mitchell**Org:** AWMD/WRAP**Phone:** 913-551-7633**Project ID:** BMEJIARCRA**QAPP Number:** 2017052**Project Desc:** Electrolux GW RCRA site investigation sampling**Location:** Jefferson**State:** Iowa**Program:** RCRA Corrective
Action**Purpose:** Compliance Monitoring**GPRA PRC:** 000D99

Brian Mitchell
RCRA Corrective Action Officer
EPA Region 7
AWMD/WRAP

Per BMitchell email dated 3/26/18: This ASR is not part of a litigation hold at this time.

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

Units: Specific units in which results are reported.

___ = Field Sample
FB = Field Blank
FD = Field Duplicate

ug/L = Micrograms per Liter

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.

U = The analyte was not detected at or above the reporting limit.

UJ = The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J = The identification of the analyte is acceptable; the reported value is an estimate.

ASR Number: 7817**Sample Information Summary****06/19/2018****Project ID:** BMEJIARCRA**Project Desc:** Electrolux GW RCRA site investigation sampling

Sample No	QC Code	Matrix	Location	Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 - ___		Water	@ MW-2 @	East end of Adams Street		05/24/2018	18:57			05/29/2018
1 - FD		Water	@ MW-2 @	East end of Adams Street		05/24/2018	18:57			05/29/2018
2 - ___		Water	@ MW-1 along	East side of North Cedar Street		05/25/2018	13:45			05/29/2018
4 - FB		Water	LDL VOA Trip	Blank		05/25/2018	14:30			05/29/2018
5 - FB		Water	LDL VOA Field	Blank		05/25/2018	14:45			05/29/2018

Analysis Comments About Results For This Analysis

1 VOCs in Water by GC/MS for Low Detection Limits**Lab:** Region 7 EPA Laboratory - Kansas City, Ks.**Method:** EPA Region 7 RLAB Method 3230.13F**Samples:** 1-__ 1-FD 2-__ 4-FB 5-FB**Comments:**

The reporting limits for cis-1,3-Dichloropropene, trans-1,3-Dichloropropene and Naphthalene have been raised (to 2ug/L, 2ug/L and 5ug/L, respectively) due to the accuracy issues at the lowest standard(s).

Bromoform (59%, LCL: 66%), Styrene (33 and 32%, LCL: 59%) and m- and/or p-Xylene (80 and 79%, LCL: 84%) were UJ-coded in sample 1. These analytes were not found in the sample at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to low recovery of these analytes in the laboratory matrix spike. The actual reporting limit for these analytes may be higher than the reported value.

Chloroform was J-coded in sample 1. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to low recovery of this analyte (94%, LCL: 95%) in the laboratory matrix spike. The actual concentration for this analyte may be higher than the reported value.

Dibromochloromethane was UJ-coded in sample 1. This analyte was not found in the sample at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to poor precision obtained for this analyte in the laboratory matrix spike and matrix spike duplicate (6.2%, PCL: 5.0%). The actual reporting limit for this analyte may be higher than the reported value.

Analysis/ Analyte	Units	1-__	1-FD	2-__	4-FB
1 VOCs in Water by GC/MS for Low Detection Limits					
Acetone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Carbon Disulfide	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	ug/L	6.4 U	8.1	3.1	1.0 U
Chloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
trans-1,3-Dichloropropene	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Ethyl Benzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Isopropylbenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Methyl tert-butyl ether	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Methylcyclohexane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
4-Methyl-2-Pentanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,2,3-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U

ASR Number: 7817

RLAB Approved Sample Analysis Results

06/19/2018

Project ID: BMEJIARCRA

Project Desc: Electrolux GW RCRA site investigation sampling

Analysis/ Analyte	Units	1-__	1-FD	2-__	4-FB
Trichloroethene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichlorotrifluoroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
m and/or p-Xylene	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
o-Xylene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U

Analysis/ Analyte	Units	5-FB
1 VOCs in Water by GC/MS for Low Detection Limits		
Acetone	ug/L	5.0 U
Benzene	ug/L	1.0 U
Bromodichloromethane	ug/L	1.0 U
Bromoform	ug/L	1.0 U
Bromomethane	ug/L	1.0 U
2-Butanone	ug/L	5.0 U
Carbon Disulfide	ug/L	1.0 U
Carbon Tetrachloride	ug/L	1.0 U
Chlorobenzene	ug/L	1.0 U
Chloroethane	ug/L	1.0 U
Chloroform	ug/L	1.0 U
Chloromethane	ug/L	1.0 U
Cyclohexane	ug/L	1.0 U
1,2-Dibromo-3-Chloropropane	ug/L	5.0 U
Dibromochloromethane	ug/L	1.0 U
1,2-Dibromoethane	ug/L	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U
Dichlorodifluoromethane	ug/L	1.0 U
1,1-Dichloroethane	ug/L	1.0 U
1,2-Dichloroethane	ug/L	1.0 U
1,1-Dichloroethene	ug/L	1.0 U
cis-1,2-Dichloroethene	ug/L	1.0 U
trans-1,2-Dichloroethene	ug/L	1.0 U
1,2-Dichloropropane	ug/L	1.0 U
cis-1,3-Dichloropropene	ug/L	2.0 U
trans-1,3-Dichloropropene	ug/L	2.0 U
Ethyl Benzene	ug/L	1.0 U
2-Hexanone	ug/L	5.0 U
Isopropylbenzene	ug/L	1.0 U
Methyl Acetate	ug/L	5.0 U
Methyl tert-butyl ether	ug/L	1.0 U
Methylcyclohexane	ug/L	1.0 U
Methylene Chloride	ug/L	1.0 U
4-Methyl-2-Pentanone	ug/L	5.0 U
Naphthalene	ug/L	5.0 U
Styrene	ug/L	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	1.0 U
Tetrachloroethene	ug/L	1.0 U
Toluene	ug/L	1.0 U
1,2,3-Trichlorobenzene	ug/L	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U
1,1,2-Trichloroethane	ug/L	1.0 U

ASR Number: 7817

RLAB Approved Sample Analysis Results

06/19/2018

Project ID: BMEJIARCRA

Project Desc: Electrolux GW RCRA site investigation sampling

Analysis/ Analyte	Units	5-FB
Trichloroethene	ug/L	1.0 U
Trichlorofluoromethane	ug/L	1.0 U
1,1,2-Trichlorotrifluoroethane	ug/L	1.0 U
Vinyl Chloride	ug/L	1.0 U
m and/or p-Xylene	ug/L	2.0 U
o-Xylene	ug/L	1.0 U

APPENDIX F
BORING LOGS

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-1

Date Drilled (Start/Finish): 5/23/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1050.30 ft

Total Depth: 150 feet

Coordinates: 42.0227163365°, -94.3692994209°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04.06

Weather: Sunny, Warm

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
								Top soil, brown, damp.
				5		CL/ML		CLAY, silty, sandy with small gravel, tan-brown with iron mottling, soft, plastic; moist.
				10				
				15		SP		SAND, tan, fine grained, damp.
				20				CLAY, silty, with small gravel, brown, soft, plastic; moist.
				25		CL/ML		CLAY, silty, with small gravel and trace amounts of very fine grained sand, brown-grey, firm, non-plastic; damp.
								CLAY as above, grading to dark grey in color, and increasing sand content with depth.
				30				SAND, clayey, silty, grey, very fine to fine grained; moist.

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-1

Date Drilled (Start/Finish): 5/23/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1050.30 ft

Total Depth: 150 feet

Coordinates: 42.0227163365°, -94.3692994209°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04.06

Weather: Sunny, Warm

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
						SC/SM		SAND, clayey, silty, grey, very fine to fine grained; moist.
				35		CL/SC		Clayey SAND/sandy CLAY, grading from grey to dark grey, very fine grained, firm; damp.
				40		CL/ML		CLAY, silty, with small gravel and trace amounts of very fine grained sand, brown-grey, firm, moderately plastic; damp.
				45				CLAY, as above, with inscreasing sand content.
				50		SC/SM		SAND, clayey, silty, tan-grey, very fine to coarse grained with small gravel; damp.
				55		CL/ML		CLAY, sandy, silty, with small gravel, tan-yellow with iron mottling, very fine to coarse grained, increasing sand content with depth, non-plastic; damp.
				60		SC/SM		SAND, clayey, silty, brown-buff with iron mottling; damp.

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-1

Date Drilled (Start/Finish): 5/23/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1050.30 ft

Total Depth: 150 feet

Coordinates: 42.0227163365°, -94.3692994209°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04.06

Weather: Sunny, Warm

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
				65		SC/SM		SAND, clayey, silty, tan with iron mottling, very fine to coarse grained with well rounded small gravel, increasing coarseness with depth; damp.
				70				CLAY, silty, tan with iron mottling, thin sand lenses at 67 and 70 ft, moderately firm, moderately plastic; damp.
				75				CLAY, silty, tan-orange, thin sand lenses at 71, 73, and 75 ft, moderately firm, moderately plastic; damp.
				80		CL/ML		
				85				CLAY, silty, with trace amounts of sand and small gravel, brown grading to dark grey, increasing sand content with depth, moderately firm, moderately plastic; damp.
				90		SC/SM		SAND, clayey, silty, tan with iron staining, very fine to medium grained; moist.

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-1

Date Drilled (Start/Finish): 5/23/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1050.30 ft

Total Depth: 150 feet

Coordinates: 42.0227163365°, -94.3692994209°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04.06

Weather: Sunny, Warm

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
				95		SC/SM		SAND, clayey, silty, tan, medium well rounded grains, poorly graded; moist.
						CL/ML		CLAY, silty, sandy, dark grey, moderately firm, moderately plastic; damp.
						SP		SAND, grey-tan, medium to coarse well rounded grains; damp to moist.
						CL/ML		CLAY, silty, sandy, dark grey, with small gravel and trace amounts very fine grained sand; damp.
				100		SP-SC		SAND, clayey, grey, very fine to fine grained; moist.
						CL/ML		CLAY, silty, sandy, with small gravel, dark grey becoming mottled with orange, red and black, moderately firm; damp.
						C		COAL, black, sub-bituminous, soft; dry.
				105		CL/ML		CLAY, silty, transitioning to SHALE; dry.
						SH		SHALE, grey, with dark grey, red, brown, orange, and purple mottling, waxy, friable.
				110				SHALE, grey with red mottling grading to all grey, waxy, hard.
								SHALE, tan-brown grading to brown-grey, waxy, hard.
				115				
						SH LS SST		Difficult drilling between 115 and 135 ft lead to poor recovery which was reduced to a 5 ft interval containing only the hardest materials. Recovered materials consisted of had SHALE, LIMESTONE, and SANDSTONE.
				120				

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-1

Date Drilled (Start/Finish): 5/23/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1050.30 ft

Total Depth: 150 feet

Coordinates: 42.0227163365°, -94.3692994209°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04.06

Weather: Sunny, Warm

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
				125		SH LS SST		Difficult drilling between 115 and 135 ft lead to poor recovery which was reduced to a 5 ft interval containing only the hardest materials. Recovered materials consisted of had SHALE, LIMESTONE, and SANDSTONE.
				130				
				135				
				140		SH		
				145		C		SHALE, dark brown, waxy, soft.
								COAL, black, sub-bituminous, soft; dry.
						SH		SHALE, grey, hard.
				150				

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-2

Date Drilled (Start/Finish): 5/21/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1058.01 ft

Total Depth: 150 feet

Coordinates: 42.0183118657°, -94.3633313442°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04

Weather: Partly Cloudy, Warm, Breezy

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
						CL/ML		6 inches Top Soil Silty clay / Clayey Silt, dark brown, firm, non-plastic; damp.
				5				CLAY, silty, medium brown transitioning to tan, trace very fine grained sand, increasing moisture and plasticity with depth.
				10				CLAY, silty, sandy, medium brown, soft, plastic, fine to coarse grained with small gravel; moist.
				15				CLAY, silty, sandy, medium brown with iron mottling, very fine to fine grained, moderately firm, moderately plastic; damp.
				20		CL		CLAY, silty, sandy, tan-brown, very fine to coarse grained with small gravel, soft, plastic; moist
								CLAY, as above becoming firm, non-plastic; damp.
								CLAY, silty, sandy, tan-brown, medium grained, very soft, plastic; moist.
				25				CLAY, as above becoming firm and moderately plastic, with increasing grain size; damp.
				30				CLAY, sandy, dark grey-brown, very fine to coarse grained, moderately plastic, firm; moist.

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-2

Date Drilled (Start/Finish): 5/21/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1058.01 ft

Total Depth: 150 feet

Coordinates: 42.0183118657°, -94.3633313442°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04

Weather: Partly Cloudy, Warm, Breezy

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
				35		CL/ML		CLAY, silty, sandy, dark grey-brown, very fine to coarse grained with small gravel, moderately plastic, firm; moist.
				40		SC/SM		SAND, silty, clayey, grey-tan, fine to coarse grained, with small gravel; moist to wet.
				45				CLAY, sandy, silty, dark grey, very fine to fine grained, moderately plastic; moist.
				50		CL/ML		CLAY, sandy, silty, dark grey-tan, fine to coarse grained with small gravel, decreasing sand content with depth; moist.
				55				CLAY, silty, sandy, dark grey-tan, medium to coarse grained, with small gravel, firm, non-plastic; damp.
						CL/SC		Sandy CLAY to clayey SAND, dark grey, iron mottling, very fine to fine grained, with small gravel; damp.
				60		CL/ML		Silty CLAY to clayey SILT, sandy, orange-brown, very fine to fine grained, non-plastic, hard; damp.

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-2

Date Drilled (Start/Finish): 5/21/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1058.01 ft

Total Depth: 150 feet

Coordinates: 42.0183118657°, -94.3633313442°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04

Weather: Partly Cloudy, Warm, Breezy

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
						CL/ML		CLAY, silty, orange-brown, with small gravel and trace amounts of fine grained sand; damp.
				65				CLAY, silty, with small gravel, orange-brown with grey and tan mottling; damp.
						SP/GP		SAND and GRAVEL, tan-orange, fine to coarse grained; damp.
						SP		SAND, tan, very fine to medium grained; damp.
				70				
						CL/ML		CLAY, silty, with small gravel, grey with iron mottling, non-plastic, very hard, damp.
				75				
				80				
						CL/ML		CLAY, sandy, silty, with small gravel, grey-tan, very fine to coarse grained, non-plastic, hard; damp.
				85				
				90				

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-2

Date Drilled (Start/Finish): 5/21/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1058.01 ft

Total Depth: 150 feet

Coordinates: 42.0183118657°, -94.3633313442°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04

Weather: Partly Cloudy, Warm, Breezy

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
				95		CL/ML		CLAY, silty, with trace amounts of small gravel, dark grey-tan, non-plastic, hard; damp.
				100				CLAY, silty, sandy, tan grading to tan-grey, non-plastic, stiff, hard; damp.
				105		SP		
				110				SAND, tan, fine grained, well sorted; damp.
				115				SAND, tan, medium to coarse grained; moist.
								SAND, silty, tan, fine to medium grained; moist.
								SAND, pinkish tan with some black mottling, soft; moist.
				120				

Boring Log Form

Site Name: Former Electrolux

Boring Number: MW-2

Date Drilled (Start/Finish): 5/21/2018

Drilling Method: Rotary Sonic

Drilling Company: Cascade Drilling

Elevation: 1058.01 ft

Total Depth: 150 feet

Coordinates: 42.0183118657°, -94.3633313442°

Depth to Water:

Geologist: L. Holt

Project Number: 103G2642035.48.04

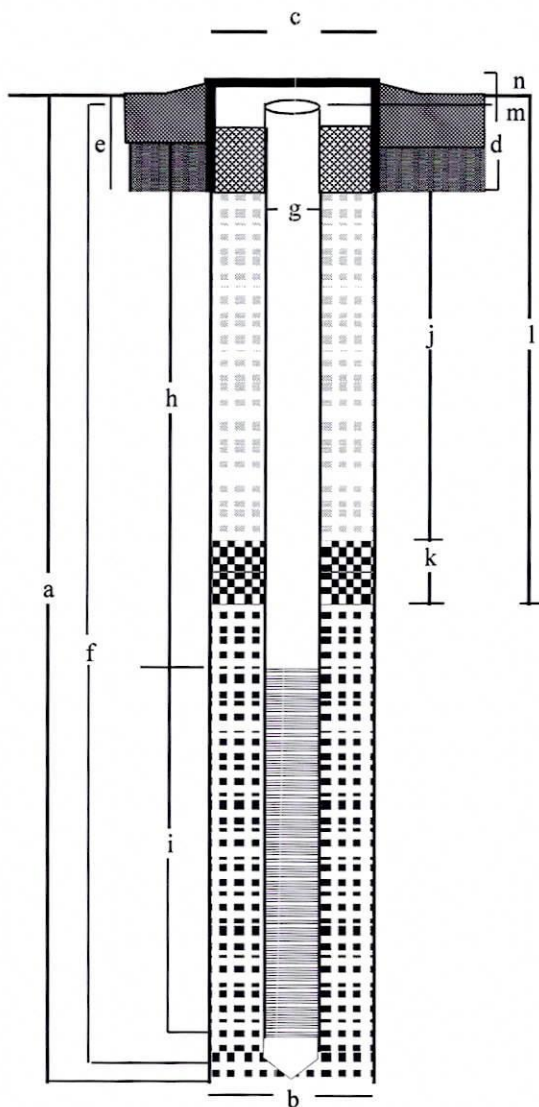
Weather: Partly Cloudy, Warm, Breezy

Sample Interval	Interval	Soil Recv.	PID Reading (ppm or ppb)	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
				125		SP		SAND, buff, very fine to fine grained, soft; damp.
				130		SC		SAND, clayey, buff-grey with iron staining, very fine grained, soft, decreasing clay content with depth; damp.
				135				
				140		SH		SHALE, dark grey grading to light grey, waxy, friable; dry.
				145				
						C		COAL, black, sub-bituminous, soft, contains minor amounts of pyrite; dry.
				150		SH		SHALE, light grey, waxy, friable; dry.

APPENDIX G
MONITORING WELL CONSTRUCTION FORMS

Tetra Tech Monitoring Well Construction Log

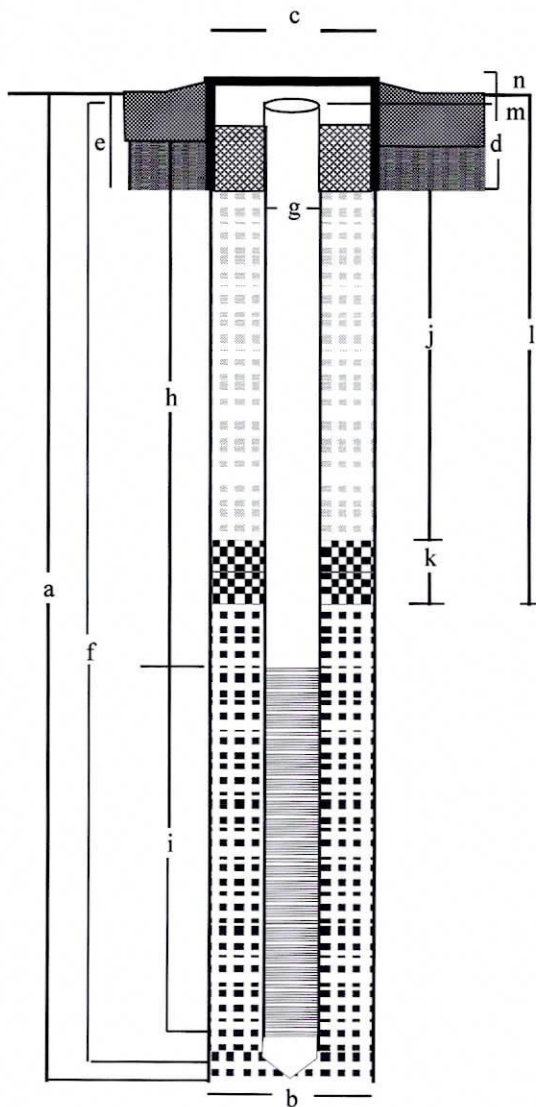
Project Name: <u>Former Electrolux</u>	Well No: <u>MW-1</u>	Date: <u>May 24, 2018</u>
Project No: <u>103G2642035.48.04</u>	Drilling Method: <u>Rotary Sonic</u>	
	<u>Cascade Drilling</u>	
Geologist: <u>L. Holt</u>	<u>Schofield, Wisconsin</u>	



- a. Total Boring Depth: 150 ft (backfilled to 99 ft)
- b. Boring Diameter: 9"
- c. Diameter of Protective Casing: 6"
- d. Length of Protective Casing: 10"
Type of Protective Casing: Steel Vault
- e. Appx. Top of Annular Seal: _____
Type of Seal Used: Portland Cement and Bentonite Mix
- Surface Casing Length/Diameter: NA
Type of Surface Casing: NA
Secondary Casing Length/Diam.: NA
- Depth of Centralizer(s) if any: NA
Type of Centralizer(s): NA
- f. Total Riser Casing Length: 98.30 ft
Length of Sediment Sump: 0.35 ft
Casing Type: Schedule 40 PVC
- g. Inner Diameter: 2"
- h. Depth to Screen: 88 ft
- i. Screen Length: 10 ft
Screen Interval: 88-98 ft
Screen/Slot Type: 10 slot
- j. Top of Bentonite Seal: 79 ft
- k. Thickness of Seal: 7 ft
Type of Seal Material: Cetco 3/8" Pellets
- l. Depth to Top of Filter Pack: 86 ft
Type of Filter Pack: Red Flint # 40 Silica Filter Sand
- m. Elevation of T/Casing: _____
- n. Surface Elevation: 1050.30 ft amsl

Tetra Tech Monitoring Well Construction Log

Project Name: <u>Former Electrolux</u>	Well No: <u>MW-2</u>	Date: <u>May 21-22, 2018</u>
Project No: <u>103G2642035.48.04</u>	Drilling Method: <u>Rotary Sonic</u>	
Geologist: <u>L. Holt</u>	<u>Cascade Drilling</u>	
	<u>Schofield, Wisconsin</u>	



- a. Total Boring Depth: 151 ft (backfilled to 134 ft)
- b. Boring Diameter: 9"
- c. Diameter of Protective Casing: 6"
- d. Length of Protective Casing: 10"
Type of Protective Casing: Steel Vault
- e. Appx. Top of Annular Seal: _____
Type of Seal Used: Portland Cement and Bentonite Mix
- Surface Casing Length/Diameter: NA
Type of Surface Casing: NA
Secondary Casing Length/Diam.: NA
- Depth of Centralizer(s) if any: NA
Type of Centralizer(s): NA
- f. Total Riser Casing Length: 133.95 ft
Length of Sediment Sump: 0.35 ft
Casing Type: Schedule 40 PVC
- g. Inner Diameter: 2"
- h. Depth to Screen: 123 ft
- i. Screen Length: 10 ft
Screen Interval: 123-133 ft
Screen/Slot Type: 10 slot
- j. Top of Bentonite Seal: 113 ft
- k. Thickness of Seal: 6 ft
Type of Seal Material: Cetco 3/8" Pellets
- l. Depth to Top of Filter Pack: 119 ft
Type of Filter Pack: Red Flint # 40 Silica Filter Sand
- m. Elevation of T/Casing: _____
- n. Surface Elevation: 1058.01 ft amsl

APPENDIX H
MONITORING WELL DEVELOPMENT FORMS

[illegible]

[illegible]

APPENDIX I
MONITORING WELL SURVEY DATA

MONITORING WELLS JEFFERSON

ELECTROLUX SITE

A15. 116037

CONFIG: IA RTN-NAV93-6124

COORDS: IA NORTH

TRIMBLE TABLET-R10

BM 100 3472589- 4685025- 1054.45

BM 101 3470885- 4684958- 1056.97
1057.03 GAS

BM 102 3470876- 4686733- 1062.14



TETRA TECH

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SFO
BLF

5/29/18

SUNNY
90°

583/
41

CHECKED ELEV NGS BM CEVS 055
1041.40' (R) 2nd ORDER CLASS I
2 RAPID SHOTS 1 SHOT K100
N. SIDE HWY 30 C.C. END FRONTAGE ROAD
NAV 88 ORTHO
1041.44 (M)

RR SPIKE IN 1st PP S. OF UP TRACKS
E. SIDE OF N. CEDAR
N. CAP BOLT ON HYDT, SW COR
N. CEDAR & ADAMS
RR SPIKE IN LAST PP E. END OF
E. ADAMS, S. SIDE

MW SOUTH (W. RIM)

3470916.7 4686548.9 1058.01

MW NORTH (W. RIM)

3472538.3 4685043.7 1050.28 GAS
1050.30

TRIMBLE	S7	LEVEL	H.T.
HT 1	135	1058.01	
BM 102		1062.14	
TP 1		1055.698	
TP 2		1054.924	
BM 101		1056.971	1057.03 GPS
TP 3		1056.164	
TP 4		1049.267	
BM 100		1054.45	
MW N		1050.30	

42





**MONITORING WELLS
ELECTROLUX SITE
JEFFERSON, IOWA**

BM100 3472589' 4685025' 1054.45'
R.R. SPIKE IN 1ST POWER POLE SOUTH OF U.P. TRACKS
EAST SIDE OF CEDAR STREET.

BM101 3470885' 4684958' 1056.97'

NORTH CAP BOLT ON FIRE HYDRANT, SOUTHWEST CORNER
OF N. CEDAR & E. ADAMS

BM102 3470876' 4686733' 1062.14'

R.R. SPIKE IN LAST POWER POLE AT THE EAST END OF
E. ADAMS STREET

MW-NORTH
 3472538.3' 4685043.7' 1050.3'

MW-SOUTH
 3470916.7' 4686648.9' 1058.01'